

# **An Analysis of Facilitative Factors in Farmer Field School (FFS) and Conventional Extension Method of Trainings among Women Groundnut Producers**

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## **Authors' contributions**

*This work was carried out by author JK. Author JK designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. He managed the analyses of the study. Author TTR managed the literature searches. All authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/CJAST/2021/v40i2931535

*Editor(s):*

(1) Dr. Santiago Silvestre, Universitat Politècnica de Catalunya, Spain.

*Reviewers:*

(1) Andréa Rossi Scalco, Brazil.

(2) Despina Sdrali, Harokopio University, Greece.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/67099>

**Original Research Article**

**Received 01 March 2021**

**Accepted 07 May 2021**

**Published 18 October 2021**

## **ABSTRACT**

There has been a paradigm shift in extension purview all over the world to factor upon participation of farming fraternity in all possible ways of extension services. In spite of several efforts over three-four decades the technology transfer process and methodology still remains the same and unchanged. While the world bank introduced (in 1970s) Training and Visit (T&V) system of top down extension approach focusing on dissemination of Green Revolution technologies, the Food and Agriculture Organization (FAO) introduced Farmer Field School (FFS) (in 1980s) that emphasized mainly the bottom up-participatory-facilitative approaches in technology transfer process. The objective of this paper is to study the facilitative factors followed in both conventional and FFS way of training, this was assessed through 10 training topics covered in both the method of trainings. Three hundred (300) farm women who had involved in groundnut cultivation in

Pennagaram villages, Dharmapuri, India who got trained under FFS and T&V ways separately were surveyed for this study. From 90 to 95% of the survey respondents indicated that they found the facilitative factors followed in FFS way of training was better effective than T&V way of conventional extension training. The mean scores of FFS ranged from 0.82 to 0.94 and significantly differed with the T&V way of conventional extension training score ranged from 0.03 to 0.16.

*Keywords: Farmer Field School (FFS); Training and Visit (T&V); Economic Threshold Level (ETL).*

## 1. INTRODUCTION

Extension services world over play a major role in technology transfer to the farming community in addressing array of problems in crop production and allied farm sectors [1]. While the problems are interlinked in farm scenario, the approach by extension services also need to be in consonance and broad-spectrum. There have been many different models in practicing extension work. The Farmer Field School (FFS) way of extension is widely admired and practiced as this embodies people-centric-participatory learning methods to create an experiential learning environment. In FFS, participants can exchange knowledge and experience by doing on-field exercise in a risk free setting. Beginning in the mid-1970s the World Bank introduced the Training and Visit (T&V) extension system into about 70 countries including India [2]. The stimulus for these investments was to speed up the dissemination of Green Revolution technologies to farmers, mainly in Asian and African countries [1]. Of late in ensuing years, there has been paradigm shift in Technology Transfer extension approach i.e. Training & Visit (T&V) to more facilitative and participatory approaches as we could see in FFS method of extension. The Farmer Field School (FFS) approaches promoted by FAO (in 1980s) have been tried widely and have created positive impact on crop and soil productivity in many Asian and African countries [3]. Addressing array of farm related problems can only be possible when the farmer participation is ensured by putting them in an experiential learning environment with long association. While FFS way of extension ensures it, the conventional way of (T&V) extension system not concerned about farmer participation and its methodological approaches are still at an inadequate level and not yet refined [4].

The objective of this paper is to discuss the facilitative factors followed in FFS and conventional (T&V) way of extension trainings. The farm women who underwent the season long FFS training and T&V way of trainings on

their groundnut cultivation were surveyed; their responses are foundation for the discussion here in this paper.

## 2. METHODOLOGY

Two groups of women groundnut producers in different villages who underwent training for 4 months (May-August) were selected and the data were collected during September-October. A set of 10 training topics were taken for assessing the facilitative factors used by both the trainings. Both FFS and T&V way of training adopted their own way of facilitation to train women groundnut growers for the entire crop season. The responses of 150 participants (from 5 villages) trained under FFS and another 150 participants (from 5 villages) trained under T&V way were collected and assessed. The survey was implemented through farm and home visit, directly interviewed the participants adopting proportionate random sampling technique. Their response was collected on 2 points continuum such as Yes or No. The response data were analyzed using the mean score and Z-test statistics with significance level set at 5 and 1 per cent level.

## 3. RESULTS AND DISCUSSION

The respondents from FFS way of training villages comprised of 50% ( $n=150$ ) across 5 villages and respondents from T&V way of training villages comprised of 50% ( $n=150$ ) across another 5 villages.

All the respondents were female with a mean age of 35-45 years (Table 1) both in case of FFS and T&V trained groups of farmers. Majority of respondents in FFS group had middle (39.3%) and secondary (33.4%) level of education and in case of respondents in T&V group had almost similar education level such as middle level of 36.7% and secondary level of 32.0% respondents. In both the cases college level education found to be almost equal that ranged 2.0% in FFS group and 2.6 in T&V group. In case of illiteracy in FFS group found to be lesser (2.0%) than the T&V group (4.7%). While in case

of functionally illiterate found to be same (6%) in both the cases, the primary level of education also found to be nearer such as FFS group with 17.3% and T&V group with 18.0%. Similarly, in case of farming experience 61.4% of respondents in FFS group and 63.3% of respondents in T&V group had medium level of education. The low level of farming experience found to be 19.3% of respondents in FFS group and 18% in T&V group. While 19.3% of respondents had high level of farm experience in FFS group, it was 18.7% of respondents in T&V group. While the FFS training went on in an on-field situation as per its methodology, the T&V system followed their own way of methodology by conducting class room trainings. The training topics followed were common in both FFS and T&V as given in Table-2.

**Table 1. Characteristics of respondents**

Category	FFS farmers (n=150)	T&V farmers (n=150)
Mean age (yrs)	35-45	35-45
Education (%)		
illiterate	2.0	4.7
Functionally illiterate	6.0	6.0
Primary	17.3	18.0
Middle	39.3	36.7
Secondary	33.4	32.0
Collegiate	2.0	2.6
Farming experience		
Low	19.3	18.0
Medium	61.4	63.3
High	19.3	18.7

Groundnut cultivating women farmers who underwent FFS (150 farmers from 5 villages and

another similar group of women (150 farmers from 5 villages) trained by conventional extension services were surveyed to know whether and how the facilitating factors followed while training their participants. In context, various training topics and facilitative methods followed were identified and used to get their response. The data were analyzed and the result indicated that FFS participants' response on the facilitative factors followed to know *the importance of Yellow sticky traps* significantly differed with the response of T&V way of trained participants. The mean scores of FFS participants (0.88) showed as more than that of T&V (0.09) way of training. The reason might be that FFS used the facilitating factor of "Installation of multi colored sticky traps", where participants were facilitated on-field in sub groups to prepare low cost yellow sticky traps of various colors (blue, green, white, yellow) smeared with castor oil and installed them in various subplots in field, they observed after one hour and counted the sucking pests stuck over different traps and found the difference. Each sub groups presented their findings that yellow colored traps attracted more insects than others and thereby decided to install yellow sticky traps to control sucking pests. The entire facilitative process in FFS had involved the participants to learn experientially on their own and no readymade answers given and the participants were kept in discovery learning process. This supported participants to understand easily, improved their skills in making traps, triggered analytical mind in finding and deciding suitable color that attracts insects that also enhanced their decision making capacity. Whereas in T&V system of training, the trainer explained about the uses of yellow sticky traps readily and the recommendations about how many traps to be

**Table 2. Facilitating factors followed in various activities of FFS and T&V way of training**

Sl no.	Training topics and Facilitative factors	Mean Scores		z-Test Statistic	P-Value
		FFS	T&V		
1	Topic: Importance of Yellow sticky traps	0.88	0.09	22.41	0.00
2	Topic: Avoiding indiscriminate pesticide spray	0.94	0.04	37.07	0.00
3	Topic: Importance of Mulching	0.82	0.16	15.29	0.00
4	Topic: Understanding various varieties and their characters	0.94	0.03	38.67	0.00
5	Topic: Insects and their role in crop production	0.93	0.03	37.00	0.00
6	Topic: Importance of FYM application	0.92	0.04	33.93	0.00
7	Topic: Assessment and management practices in the groundnut field	0.91	0.06	28.85	0.00
8	Topic: Importance of timely weeding	0.85	0.13	17.81	0.00
9	Topic: Identification of beneficial insects	0.86	0.12	19.29	0.00
10	Topic: Appropriate Cropping systems for groundnut	0.92	0.04	33.21	0.00

installed in the field, where to be purchased, the cost etc., the related pictures were showed in power point texts with lecture mode of explanation, while this devoided the participants, their participation and bottom up involvement were not encouraged.

Similarly while training farmers on *avoiding indiscriminate pesticide spray*, the FFS way of training followed a farmer centric field experiment such as “*Leaf cutting experiments by farmer in sub groups*”, they were facilitated to do on-field experiments to remove leaves of early stage plants @ 25%,50%,75% and 100% and observed those plants about how compensated on their own with fresh leaf emergence and the yields of those plants was compared with other plants and found equal with nil significant difference. This facilitative-on-field experimentation taught them not to spray any pesticide for leaf damage and pest occurrence (before reaching ETL) unnecessarily as the plants have its own compensatory ability. Whereas the trainer in T&V mode explained to the participant about the ill-effects of indiscriminate pesticide spray in a lecture mode showing the power point text and photos, where the participants involvement through simple exercise was deficit. The result indicated that FFS participants’ response had significantly differed with the T&V participants. The mean score of FFS training (0.94) showed as more than that of T&V (0.04) way of training.

In case of training farmers on the *importance of Mulching*, FFS way of training used the facilitative factor like participants were involved in “on-field *Mulching experiment in sub plots*”, facilitated to put mulching to the plants at young stage, observed on weekly intervals till the harvest, plant biometric observations were compared with unmulched crops and found that mulched plants’ growth and establishment with yield was better than unmulched. Whereas, the participants in T&V way of training could not see this way of facilitative learning environment instead they were taught orally in lecture mode. Hence, the mean score of FFS (0.82) way of training significantly differed with mean score of T&V (0.16) system of training. Similarly, the mean score of FFS (0.94) training significantly differed with mean score of T&V (0.03) in varietal character study. While the participants (of FFS) were educated on *various varieties and their characters*, FFS way of training involved the participants on-field Varietal Trials where the participants gained knowledge on different

varieties by taking biometric observation at different crop growth phases till harvest, whereas in T&V way of training, various verities, their characters and differential performance were explained by lecture and pictorial mode only [8].

On the training topic of *Importance of FYM application*, the participants of FFS were facilitated to do an experiment of assessing “*water holding capacity of various soils with FYM mixed in different proportion*”, the mean scores of FFS participants (0.92) significantly differed with the T&V (0.04) participants. The reason due to the involvement of participants in sub groups directly doing the experiment on their own by collecting various soils red, black, lateritic, sandy and put them in transparent jars added with Farm Yard Manure (FYM) @ 25%,50%,75%, poured with specified quantity of water and the water infiltrated down to the holes made in each jar was measured to know how the FYM content at various proportion in different soils influenced upon the water holding capacity of soil. Similarly, in case of *appropriate cropping system for groundnut*, FFS participants got involved in the field right from sowing till harvest. They maintained cumbu as border crop that they found preventing entry of whitefly and other sucking pests in later stage, castor crop trapped the worms that otherwise would have attacked the groundnut plants, cow pea as boarder crop that attracted the beneficial insects like lady bird beetle that started predated on aphids attacking groundnut crops. The participants experienced the on-field learning and learnt during season long crop period. This way of season long facilitation process in FFS empowered participants in multifaceted way. Whereas in conventional training, the trainer explained the various soil properties, the importance of FYM application and about appropriate cropping system theoretically that obviously participants could not experience in the real field situation [5].

Similarly, the mean scores of FFS (0.85 & 0.86) found to be significantly differed with T&V (0.13 & 0.12) respectively with two training topics covered such as *Importance of timely weeding* and *Identification of beneficial insects*, where, FFS followed *the Nutritional uptake experiments* as the facilitative approach and involved the participants to immerse roots of crop and weed plants separately in colored solution taken in conical flasks, the color of total weed plant’s changed quickly than the crop plants. This supported participants to understand that weed plants uptake soil nutrients very quickly than the

crops plants, hence decided for timely weeding. Similarly, FFS followed the facilitative approach of “polybag and petridish study” to identify beneficial insects, where the insects (such as Aphids and ladybird beetles) were collected in poly bags and petridish along with few leaves of groundnut plants, allowed for some time and participants found that aphids ate the leaves but the lady bird beetle predated on aphids. Thus, they identified the aphids as crop pest and lady bird beetle as predator (beneficial to crop). In T&V way of training most of the technical explanation was given orally with in class room sessions.

In FFS, the training topic *Insects and their role in crop production* was dealt by facilitating participants in sub-groups to prepare *Insect Zoo* with potted plants covered with mesh and the pests (Aphids) 10-20 nos. and predator (lady bird beetle) one or two were released inside for identifying their role and function. Each sub-group went with such arrangements that aroused their curiosity in observing about what the insects do with plants. At the end, they observed that aphids moved to the apical portion of groundnut plant and sucked the plant sap of young leaves and the lady bird beetle also moved to the apical portion but did not damage leaves but started eating the aphids. Participants were stunned to see the phenomenon within half an hour that each lady bird beetle could eat away 5-7 aphids that were attacking groundnut leaves. Such study was an eye opener for the farm women that they could understand the importance of predators and how they controlled pests naturally. All the participants from sub-groups presented their similar observations and took a strong decision of not to spray pesticides indiscriminately. Such facilitative process in FFS found to be worth as they enlightened and brought a dramatic change in mind sets of participants. But, in T&V system of training, technical explanation on pests and predators was given elaborately by showing various pictures. This might be the reason for the mean score of FFS (0.93) that significantly differed with the mean score of T&V (0.03) way of training.

Similarly, while dealing the training topic of *Assessment and crop management practices in groundnut field*, the facilitation method of *Agro Ecosystem Analysis (AESAs)* was followed in FFS way of training where, in each session the participating farm women were sent to the ground nut field and facilitated to observe crop plants of both experimental and control plots (FFS training had experimental and control

plots), took plant biometric observation such as measuring height, counting leaves, branches, flowers, pegs, pods, root length, observing soil moisture, presence of eggs, pupal cases, insects, predators on-field etc.. in sub-groups they prepared the charts by drawing the plants, insects etc.. and tabled the data observation, presented the charts and took decision on further course of management practices. This exercise found to be routinely followed in each weekly session with appropriate follow up actions till the crop harvest. At the end participants shared their results and experiences with larger groups of respective village through field days to upscale the results and outcome.[6,7] Whereas in conventional training, lecture mode of explanation using pictures, power point texts, postures etc.. were used to explain. Hence, the mean scores FFS (0.91) way of training significantly different with T&V (0.06) way of conventional extension training.

#### 4. CONCLUSION

On the whole, it is apparent that FFS at all moments focused on participant's involvement by creating discovery and experiential learning environment rather than giving them technical inputs readily [8,9]. Participants did things on their own, took their own decision, their involvement in on-field activities enhanced their skills; hence participants could learn complex things more easily, where as in conventional training these were found to be deficit as most of the time the training went on in class room environment and devoid of situation to involve participants to experientially learn things [10,11]. The study has doubtlessly indicated that the FFS way of training as more effective and there is reason for considering the cue in redefining and revitalising the farm research system. FFS with less infrastructure and manned by few facilitators could bring in more effective result among its group members. These facts should be very seriously considered by the well established almost a century old Government extension system in removing the bottlenecks in effective functioning. The present research was focused only on single crop on a limited geographical area. Similar studies may be focussed on other crops and farming community in different locations.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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